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Broad-band mass measurements in storage rings

Freitag, 16. Juli 2010 10:00 (30 Minuten)

Recent experiments with stored exotic nuclei, that have been performed at the Experimental Storage Ring ESR in Darmstadt, Germany, will be discussed in this contribution.

Broad-band Schottky (SMS) and Isochronous (IMS) mass spectrometry are extremely powerful methods for simultaneous measurements of big numbers of nuclear masses in one experiment. The former method is applied to electron-cooled beams and can therefore address nuclides with half-lives longer than about one second. The shortest lifetimes that can be measured with the second method are in the few-ten microseconds range. Both methods are sensitive to single stored ions.

Large-scale explorations of the nuclear mass-surface have been done in the last years providing a vast information on nuclear structure properties, such as the limits of nuclear existence, nucleon separation energies, nucleon-nucleon interactions, etc. Several new long-lived isomeric states and new neutron-rich isotopes have been discovered.

The present status of the experiments and some preliminary results will be presented. Plans for future experiments including the prospects for the new storage ring facility CSRm-CSRe in Lanzhou will be outlined.

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Sitzung Einordnung: Session 3: Experiments for r-process